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Contractual Savings Institutions and Banks' Stability and Efficiency

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This paper argues that contractual savings (assets of pension funds and life insurance companies) contribute to the improvement of banks' efficiency, credit, and liquidity risk. The authors use bank level panel data across countries to assess the impact of contractual savings on bank efficiency and lending behavior. They concentrate on profitability measures and on term transformation and credit risk indicators.

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Summary findings

Impavido, Musalem, and Tressel analyze the relationship between the development of contractual savings institutions and banks' efficiency, credit, and liquidity risks. They discuss the potential mechanisms through which the development of contractual savings institutions may affect the banking sector. They show that the development of contractual savings institutions has a significant impact on bank spreads and loan maturity.

After controlling for banks' characteristics, macroeconomic factors, and more standard indicators of financial development, they show that the development of contractual savings institutions is associated with increased efficiency of the banking system and greater resilience to credit and liquidity risks.

This paper—a product of the Financial Sector Development Department—is part of a larger effort in the department to study the effects of contractual savings on financial markets. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Patricia Braxton, room MC9-704, telephone 202-473-2720, fax 202-522-7105, email address pbraxton@worldbank.org. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at gimpavido@worldbank.org, amusalem@worldbank.org, or tressel@delta.ens.fr. December 2001. (27 pages)

Contractual Savings Institutions and Banks' Stability and Efficiency

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INTRODUCTION

The emerging economies' crisis stress repeatedly the risks associated with the international financial system. Excessive volatility of capital flows exacerbates the structural weaknesses of these economies, especially in the banking system. Thus, policy makers are urged to reassess banking supervision and regulation. However, this cannot go without a clearer understanding of the interaction between banks and other components of the financial structure to define future strategies.

Recent studies show indeed that contractual savings have become important actors of financial systems in developed and also in a handful of emerging economies (e.g., Chile, South Africa). They are also growing at a fast pace in several Latin American countries (e.g., Argentina, Mexico) and demographic evolution may increase the benefits associated to a funded system in other countries. Impavido and Musalem (2000) and Catalan, Impavido and Musalem (2000) show that the development of institutional investors, in particular contractual savings, partly explain the rapid expansion of stock markets over the past 15 years. Impavido, Musalem and Tressel (2001) show moreover that the development and asset allocation of contractual savings have had an independent impact on firms' financing choices after controlling for macroeconomic and firms' characteristics. They identify several channels. In market-based economies, an increase in the proportion of shares in the portfolio of contractual savings leads to a decline in firms' leverage. In bank-based economies, instead, an increase in the size of contractual savings is associated with an increase in leverage and debt maturity in the corporate sector. This suggests that firms are more resilient to refinancing or bankruptcy risks.

However, while the banking system plays a crucial role in most economies as it provides external finance to firms excluded from the securities market, the interaction between contractual savings institutions and banks and its implications on the cost of capital for the firms has not been assessed yet.

Impavido, Musalem and Tressel (2001) propose several mechanisms through which contractual savings interact with the banking sector and that are consistent with their results. First, contractual savings, as competing intermediaries, may increase the efficiency of the banking sector. Underwriting costs may also decrease, thus lowering the cost of access to capital markets. Moreover, banks may respond to more intense competition by concentrating on their core comparative advantage - that is their superior ability to monitor firms - and increase short-term loans. As bank liabilities are liquid, this may reduce the balance sheet mismatch of the banking sector. Second, contractual savings institutions may also be complementary to banks. Indeed, banks may for instance issue long-term securities bought by contractual savings institutions, or the latter could invest in long term bank deposits. As a result, the term-transformation risk in the banking sector may decrease. The development of contractual savings institutions may therefore increase the stability and efficiency of the banking system when adequate regulation and supervision are effective.

This paper provides a first step in providing a better understanding on the impact of contractual savings development on the banking system. First, we provide a discussion of the potential channels through which the development of contractual savings

institutions might affect the efficiency and stability of the banking system. Second, using bank level data across countries we provide regression analysis on panel data in order to assess the impact on contractual savings on bank efficiency and lending behavior. We concentrate on profitability measures and on term transformation and credit risks indicators.

I INTERACTION BETWEEN CONTRACTUAL SAVINGS INSTITUTIONS AND BANKS

In this section, we discuss the potential mechanisms through which the development of contractual savings institutions might affect the banking system. We want to address two main questions. First, does the development of contractual savings institutions increase or decrease the competitive pressures on banks? In other words, are banks and contractual savings institutions substitute or complementary? Second, does the development of contractual savings institutions enhance the stability of the banking system?

The broad movement of financial liberalization that started in the early eighties has deeply modified the functioning of banking systems in many countries. Increased competitive pressures may increase efficiency of the banking system, but may also increase instability when proper regulation and supervision is not set. Surprisingly, few studies have analyzed the efficiency, profitability and balance sheets of banks on a cross-country basis[1]. In particular, whereas financial liberalization was often associated to competitive pressures from non-bank financial institutions, there has been, to date, no attempt to analyze both empirically and theoretically the interaction between the banking system and other financial institutions (except the stock market)[2].

First, we want to assess whether the development of contractual savings institutions has increased the competitive pressures on the banking system, and more particularly how the behavior of banks has been affected, across countries and over time. In doing so, we want to assess the specific impact of contractual savings, after controlling for banks' characteristics, financial sector development, and the macroeconomic environment.

Contractual savings institutions will act as competing suppliers of funds, hence competitive pressure on the banking systems will increase, either indirectly or directly. Contractual savings institutions will indirectly increase competitive pressures because the development of contractual savings institutions is associated to the development and increased liquidity of the capital markets (Impavido and Musalem (2000)). The cost of issuing securities will decrease[3], hence reducing the market power of banks[4]. Moreover, contractual savings institutions may increase the supply of public information on capital market and have positive spillover effects on the monitoring of borrowers by banks. In

[1] See, however, Demirguc-Kunt and Huizinga (1999a, 1999b), Davis and Tuori (2001) and Claessens, Demirguc-Kunt and Huizinga (2001).

[2] Allen and Santomero (1999) claim that the broad movement towards more market finance, that was initiated in the 80s, has led to a greater importance of non-bank financial intermediation.

[3] Underwriting costs may decrease, as argued by Vittas (1999) and the supply of funds will increase on capital markets.

[4] See Rajan (1992) who analyzes the welfare gains of increasing firms' outside financial opportunities. See also Petersen and Rajan (1995).

addition, the development of contractual savings institutions will directly increase the competitive pressures on the banking system. First, they will compete on the saving side (for instance, in France, the development of life insurance over the past 10 years has implied a significant reallocation of savings from more "classic" banking savings instruments). Second, they will compete on the lending side, either directly or indirectly, by increasing the demand for securities on the primary markets. Hence, we should expect to observe an impact on banks behavior. Competition, however, will be two-dimensional. First, competition will be in *price*, thus we should expect a decrease in bank net interest margins as contractual savings institutions develop. Second, banks may modify the *maturity* of their loans. As contractual savings institutions have a comparative advantage in supplying long-term finance[5], banks may decrease the maturity of their loans[6]. Therefore, one might expect to observe a decrease in the maturity of bank loans.

However, contractual savings institutions may also be complementary to banks. First, as noticed by Demirguc-Kunt and Maksimovic (1996), banks and stock markets may be complementary[7]. Information disclosure requirements and generally the increased transparency associated to capital market development may stimulate the monitoring activity of banks[8], lowering the credit risk borne by the banking sector[9]; an increase in bank lending and total profitability may be observed as capital markets develop. Second, contractual savings institutions may provide long-term resources to banks, thus reducing the interest rate and liquidity risk in the banking system by limiting the term transformation activity of banks[10]. Therefore the maturity of bank loans may increase if such complementarity effects dominate.

Second, the development of contractual savings institutions may increase the stability of the banking system, thus reducing systemic risks that may potentially lead to banking crisis[11]. This would be the case if the development of contractual savings institutions reduces the risks borne by the banking sector. First, credit risk may be reduced if the development of contractual savings institutions leads directly or indirectly to an increase in bank monitoring. Second, the development of contractual savings institutions may reduce interest rate risks and liquidity risks associated to the term transformation of assets realized in the banking system. On the one hand, as noticed in the previous paragraph, if

[5] Contractual savings institutions have long-term liabilities.

[6] The maturity choice is also affected by monitoring decisions (Stiglitz and Rey (1993)).

[7] Bank and market finance are complementary also because they finance different segments of the firm population: see Diamond (1991), Bolton and Freixas (2000) among others.

[8] However, the theoretical relation between stock market transparency, liquidity, and monitoring of firms by claimants (banks or investors) is not clear-cut as first illustrated by Grossman and Stiglitz (1984). See also Holmstromand Tirole (1993).

[9] Davis (2001) stresses the "multiple avenues" of financial systems by comparing aggregate net flows of bank loans and market debt finance.

[10] Following Diamond and Dybvig (1983), systemic risk in the banking system has been identified as a consequence of maturity transformation and the "sequential service" constraint on bank liabilities; in addition, imperfect information and moral hazard increase this fragility of the banking system (Chen (1999)). Freixas and Rochet (1997) provide a guidebook to microeconomic theories of banking.

[11] Increased competitive pressures and financial stability are not incompatible. For a recent theoretical analysis, see for instance Koskela and Stenbacka (2000) who show that loan market competition, which leads to a reduction of lending rates and higher investments without increasing the equilibrium bankruptcy risk of firms. In addition, whether a reduction in term transformation risk in the banking system leads to more or less efficient lending decisions is an empirical question.

contractual savings institutions are competitors to banks, the latter may indeed respond to competitive pressures by concentrating on their core comparative advantage (associated to narrow banking), -that is their superior ability to monitor firms – and increase short-term loans. Banks will therefore be able to avoid losses caused either by unexpected increase in short-term interest rates or by sudden withdrawals. On the other hand, if contractual savings institutions provide resources to the banking system (either in the form of loans, deposits, or by buying securities issued by banks), banks will be less subject to liquidity risks for a given level of long-term assets. They may therefore increase the supply of long-term loans[12]. Finally, the recent emerging economies' crisis have stressed the risks associated to short-term capital flows. Excessively volatile capital movements have exacerbated the structural weaknesses of these economies, that were magnified by fragile banking systems[13]. This financial risk is associated to the difficulty (or impossibility) for these economies to borrow abroad in their own currencies, and long-term. One of the solution is to deepen domestic financial system in order to develop domestic sources of long-term finance (see for instance Caballero (2001)), which is the comparative advantage of contractual savings.

The development of contractual savings institutions, given adequate regulation and supervision[14], may therefore enhance the stability and efficiency of the banking system.

II DATA AND EMPIRICAL STRATEGY

II.A Data

We use balance sheet and income statement of commercial banks, aggregated by country each year, from the Bankscope data base provided by IBCA. We use an unbalanced sample of banks over the period 1991-2000, in order to maximize the time-series dimension for each country.

The database on contractual savings is taken from Impavido and Musalem (2000), extended for several countries (Argentina, Brazil, India and Mexico). It includes information from different sources (including the OECD institutional investors data 2000, and national sources) on total assets, financial assets, and allocation of assets for pension funds and insurance companies.

All other macroeconomic variables are obtained from various sources: Datastream, the World Development Indicators, the IMF International Financial Statistics and the Bank for International Settlement for bond markets data.

[12] Our results are consistent with this assertion.

[13] See the recent literature, such as Aghion, Banerjee and Bachetta (2000), Caballero and Krishnamurthy (2000), Chang and Velasco (1999), Rodrik and Velasco (1999) and Deckle and Kletzer (2001). For empirical analysis, see Demirguc-Kunt and Detriagache (1997, 1998, 2000) and Harwood et al. eds. (1999).

[14] See Barth et al. (2001) for an analysis of the prudential regulation of banks (see also Dewatripont and Tirole (1994)). Generally, La Porta et al. (1997, 1998) claim that laws are important determinants of cross-country differences in firms' external finance choices.

II.B Definition of variables and empirical strategy

We want to assess the impact of contractual savings institutions on banks' characteristics. More specifically, we analyze: (i) profitability (ii) the maturity structure of loans, (iii) credit risk, and (iv) the structure of liabilities. We focus on pooled (GLS) estimates and panel estimates (GLS with fixed effects). The GLS estimator corrects for heteroschedasticity specific to each panel (country). Fixed effects estimations are important in so far as they control for country specific regulatory and supervision characteristics that may partly explain the cross-country variation of our bank variables[15] [16].

The dependent variables that we consider are: (i) net interest margin (NIM), defined as the accounting value of a bank's net interest income over total assets, (ii) profitability (Profit), defined as profit before taxes over total assets[17] [18], (iii) loan maturity defined as short-term loans (with maturity less than one year) over total loans (STL), (iv) credit risk proxied by loan loss provisions (over total assets, or over total loans), and (v) the importance of short-term liabilities, proxied by customer + short-term funding (over total assets).

The two first variables describe the profitability of banks, hence proxy for their efficiency. The NIM variable accounts for banking spreads; this variable allows us to assess whether banks pricing behavior may be affected by the development of contractual savings institutions. In addition, the NIM is also affected by the credit risk borne by the banks. The NIM variable is indeed an ex-post measure taking into account the *realized* default rate. For these reasons, we use also the Profit variable that accounts for all sources of bank profits.

The third variable describes the maturity transformation activity realized in the banking system; more specifically, we want to test whether the development of contractual savings institutions has had an impact on the maturity of bank loans. In other words, do banks increase or decrease long-term lending when contractual savings institutions develop?

The fourth set of variables aim at describing the credit risk borne by the banks. We use two measures: first, loan loss provisioning over total assets is the relevant variable to understand the indirect impact of contractual savings on profitability via the reduction in credit risk. The second variable, loan loss provisions over total loans, roughly describes the risk of the loan portfolio.

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[15] Fixed effects estimator use the *time* variation *within* countries to estimate partial correlations between the dependent and explanatory variables.

[16] We also checked that our results are not affected by the inclusion of time dummies common to all countries.

[17] See for instance Demirgüç-Kunt and Huizinga (1999a, 1999b).

[18] From the income statement, we have the following accounting identity: Profit = NIM + non-interest income / TA – overhead expenses / TA – loan loss provisioning / TA.

We use three sets of explanatory variables: (i) banks' characteristics, (ii) macroeconomic factors, and (iii) financial system characteristics[19]. All the relevant variables are expressed in percentages.

II.B.1 Bank-specific characteristics

The first bank characteristic is the book value of equity divided by total assets (ETA). Recent studies (see for instance Demirgüç-Kunt and Huizinga (1999a, 1999b) for cross-country comparisons) show that there exists a positive relationship between bank profitability and capitalization. High capitalization and profitability may indeed reflect a high franchise value (Caprio and Summers (1993)). Moreover, well-capitalized banks may face lower bankruptcy risks, thereby reducing their costs of funding. In addition, we want to control that loan maturity is not explained by the structure of banks liabilities.

The second variable controlling for the structure of bank liabilities is customer and short-term funding over total assets. It includes all short-term and long-term deposits plus other non-deposit short term funding. Again, this variable controls that loan maturity is not driven by the structure of liabilities. This is important in so far as we want to test whether the development of contractual savings institutions has an independent impact on bank loan maturity that is not driven by other bank-specific characteristics.

We include two variables describing the structure of bank activities. The first one is total loans over total assets. The second one is non-interest earnings assets over total assets. Non-interest earnings assets are mainly cash and non-interest earnings deposits at other banks.

Finally, we control for overhead expenses, expressed as a percentage of total assets. This implies that differences between net interest margin and profits before taxes are explained by variations in non-interest income (or taxes and provisions for loan losses).

II.B.2 Macroeconomic factors

Various macroeconomic factors may affect banks profitability and loan maturity. We use the Log of GDP per capita as a broad measure of economic development. Richer economies have in general more efficient institutions, a better compliance with the legal system in general, and with creditor rights, accounting standards and transparency rules (on the stock market) in particular. Moreover, the inclusion of country fixed effects further controls for unobserved country-specific regulation and supervision. The inflation rate is an indicator of both the government's management of the economy and whether long-term contracting is likely to be widespread. It characterizes also the opportunity cost of holding money. We also include government fiscal balances (% GDP) to control for the demand for public debt[20].

[19] In order to provide comparable results, we choose explanatory variables similar to those used by Demirgüç-Kunt and Huizinga (1999a, 1999b).

[20] We also used Government debt over GDP. Our main results are not affected. We choose not to report these regressions because of the more limited country coverage.

II.B.3 Financial system characteristics

The stock market and banking sector variables control that our contractual savings variables are not simply a proxy for the level of development of the financial system and the degree of competition between capital markets and banks[21].

II.B.3.1 The stock market

First, we measure the size of stock markets by the stock market capitalization (in percentage of GDP). This variable has been widely used in the recent literature. The ability of the stock market to provide risk diversification opportunities and information also depends on its level of activity and liquidity (Levine and Zervos (1998)). Greater liquidity will encourage investors to acquire stakes in risky firms[22] and will enhance information acquisition by large investors (Holmstrom and Tirole (1993)). Greater informational content in prices will increase the efficiency of capital allocation, whereas better public information may have a spillover effect on the long-term debt market by reducing initial informational asymmetries, as illustrated in the model in Impavido, Musalem and Tressel (2001). Activity in the stock market is measured by total stock traded over GDP and liquidity is proxied by the turnover ratio, that is the total value traded, in proportion of the stock market capitalization.

II.B.3.2 The banking system

The degree of competition among banks, and between banks, capital markets and other non-bank financial intermediaries depends on the level of development of the banking system. Moreover, the tendency of banks to engage in long-term lending may also depend on the deepening of the banking sector. We use domestic credit provided by the banking system over GDP as a proxy for the development and soundness of the banking sector.

II.B.3.3 Contractual savings institutions

The level of development of contractual savings institutions is proxied either by contractual savings financial assets over GDP or the log of contractual savings institutions financial assets over GDP. The Log allows to capture non linearities if for instance the impact of contractual savings development is larger for low initial levels of development than for high initial levels of development. Simple scatter-plots indeed suggest the existence of such non-linearities for NIM, profits, and loan maturity.

II.B.4 Empirical strategy

We start with summary statistics of the variables defined in the previous paragraph. A detailed description of the evolution of contractual savings institutions over the period studied in our sample can be found in Impavido, Musalem and Tressel (2001). Next, we

[21] Whereas the level of development and characteristics of capital markets (and the size of the banking sector) may affect bank profitability, recent studies suggest that financial structure per se (that is the relative importance of capital markets and the banking sector) has not additional impact (see Demirguc-Kunt and Huizinga (1999b), Demirguc-Kunt and Levine (1999) and Beck et al. (2000)).

[22] And make efficient restructuring decisions, see Maug (1998) for a theoretical argument.

compute simple correlations between the variables. These simple statistics show a strong correlation between the development of contractual savings institutions and banks characteristics. Finally, we provide panel data analysis (GLS without and with fixed effect estimates, with a correction for heteroschedasticity). Our bank level data are aggregated at the country level for each year. The intersection of the various data set (Bankscope, Institutional Investors Data base, and World Bank Indicators) provide a sample of approximately 200 observations, and 8 years at best per country.

III EMPIRICAL RESULTS

III.A Descriptive statistics

Table 1 presents the sample of countries that are included in our contractual savings database, and the total number of banks available for each country. We have data for 34 countries, including 13 emerging economies (Argentina, Brazil, Chile, Hungary, India, Korea, Malaysia, Mexico, Singapore, South Africa, Sri Lanka, Thailand and Turkey). The contractual savings data include information on total financial assets and portfolio composition for pension funds and insurance companies (in particular corporate stocks), except for 6 countries for which we have no information on equity investments (Austria, Brazil, France, Japan, Spain, and Turkey). The Bankscope database has a very comprehensive coverage in most countries, with banks included roughly accounting for 90 % of total banking assets (Demirguc-Kunt and Huizinga (1999)).

Table 2 provides the definition of the variables used in the regressions. As described in detail in Impavido, Musalem and Tressel (2001), there has been a spectacular increase[23] in the total assets managed by pension funds and life insurance companies,[24] [25] relative to GDP. Expressed in rate of growth, the increase is even more impressive. Contractual savings financial assets, relative to GDP, have been growing at an average annual rate of 17.7%, 3.4%, 6.9%, 6.0%, 7.9%, 8.99% and 4.6% respectively in France, Germany, South Africa, the United States, the United Kingdom, Chile and Korea. As shown by Impavido and Musalem (2000) and discussed also in Impavido, Musalem and Tressel (2001), this development has been similar, in term of growth, to the development of capital markets, and may partly explain this evolution.

Table 3 provides simple descriptive statistics while Table 4 displays the correlation between the main variables. Net interest margins display some slight differences between countries, when averaged over the period, with a maximum value of 7.71% for Turkey and a minimum of 1.05% in Switzerland. Argentine banks are the most capitalized, on average (14.62% of total assets), while Belgium ones are the least capitalized (3.64%). Banks have the highest proportion of loans in their assets (72.7%) in New Zealand, while those in Brazil have the lowest proportion of loans (33.9%). The maturity of loans exhibits also significant differences (we have the information on loan

[23] Singapore is the only country in which contractual savings assets decreased relative to GDP.

[24] Musalem and Impavido (2000) show, on this sample of countries, that this explosion of contractual savings institutions may partly explain the rapid growth of stock markets over the last 15 years.

[25] In France, where pension funds are underdeveloped, the life insurance industry exploded at the beginning of the 90s as a result of strong fiscal incentives to save in life-insurance products (these savings were exempt of taxes).

maturity structure only in 15 countries): 92.5% of Greek banks loans are a maturity below 1 year while on the contrary almost 80% of loans by Belgium banks have a maturity above 1 year. Table 4 finally shows that there is a strong negative correlation between the net interest margin and the log of contractual savings financial assets (%GDP). Note that the correlation is also negative and significant if we simply consider contractual savings financial assets over GDP. The proportion of short-term loans in total bank loans is also strongly negatively correlated with LogcsfaGDP suggesting that the development of contractual savings institutions is associated with an increase in loan maturity. The structure of liabilities does not seem to be significantly correlated with the development of contractual savings[26]. Finally, credit risk seems to be negatively correlated with the development of contractual savings institutions. Note the large cross-country differences: the top 4 countries in term of credit risk (LLTA) are Hungary (2.36%), Argentina (1.56%), Thailand (1.18%) and Brazil (1.16%), while banks face the lowest credit risk in Germany (0.06%), Austria (0.10%), Belgium (0.21%) and Ireland (0.24%). In the former group, contractual savings financial assets are 4.3% of GDP on average, and 29.6% on average in the latter group. This suggests that contractual savings may have some explanatory power for such cross-country differences. The econometric analysis will confirm its robustness. This is consistent with conclusions drawn by Impavido, Musalem and Tressel (2001). Finally, Figures 1, 2 and 3 illustrate the correlation between maturity of loans, net interest margin and credit risk, respectively, with the development of contractual savings.

These simple statistics neither account for banks' characteristics, nor allow one to conclude that the correlations are not the result of the correlation with stock market and banks characteristics. In the next section, we provide a simple econometric analysis that confirms that the correlation between banks' profitability, loan policy and the activity of institutional investors is not merely a function of banks' characteristics and other macroeconomic factors.

III.B Regression results

Table 5, 6, 7, 8, 9 and 10 report regression results respectively for (1) the net interest margin, (2) the profit rate, (3) the maturity of bank loans, (4) the credit risk (loan loss provisions over total assets), (5) the credit risk proxied by loan loss provisions over total loans, and (6) the structure of liabilities (customer and short-term funding over total assets). For each dependent variable, we report OLS and within (fixed effect) estimates. In each case, time dummies are included (not displayed in the tables), and we include the full set of control variables described in the previous sections. Moreover, we controlled for the potential simultaneity bias between the dependent variable and the contractual savings variable in two ways: first, we use the lagged contractual savings variable; second, we instrumented the contractual saving variable by its lagged value and a set of lagged macroeconomic indicators (see Impavido and Musalem (2000)). This also suggests that causality - if any – is more likely to go from contractual savings development to bank profitability and loan maturity. The lag may also simply reflect the time adjustment for the impact of contractual savings to materialize.

[26] On the contrary, econometric analysis will show a strong negative correlation between short-term funds and contractual savings development.

Table 5 displays the results of the net interest margin regressions. First, the NIM is positively correlated with the capitalization ratio, which is consistent with previous studies (see Demirguc-Kunt and Huizinga (1999)). It is also significantly and positively correlated with the structure of assets, the sources of funds and overhead expenses. Note however that the last correlation probably simply reflects the financial statement accounting identity. Second, it is negatively correlated with stock market liquidity, but positively correlated with stock market activity. Government fiscal balances are negatively correlated with net interest margin, possibly reflecting macroeconomic uncertainties. Inflation and real GDP per capital growth are positively correlated with NIM when considering cross-country variations (OLS) but negatively correlated with NIM when considering within variations (fixed effects). Third, the level of development of contractual savings institutions (LogcsfaGDP) is negatively associated with net interest margin[27] when concentrating on cross country variations (however within country variation has not significant impact): We have a logarithmic relation between contractual savings development and net interest margin; this suggests that *the magnitude of the impact depends on the initial development of contractual savings institutions*. The impact is large at low initial level of contractual savings development, and it decreases as contractual savings institutions develop. Therefore, our results are consistent with the initial hypothesis that the development of contractual savings institutions is associated to increased competitive pressures in the banking system, leading banks to reduce the spreads between loan and deposit rates.

Table 6 displays the results of the profit regressions. Note now that the correlation between contractual savings development and bank profits is reversed. Indeed, while the OLS regression does not show any significant correlation, the fixed effect estimation provides a positive and significant correlation between contractual savings development and bank profitability. While banks tend to choose lower spread when contractual savings institutions are more developed, the total impact on profit is surprisingly positive. In Tables 8 and 9, we show that the impact is likely to go through a reduction in credit risk.

Loan maturity regressions are summarized in Table 7 (these estimations are realized on a subset of 14 countries for which we have the information). Note that, given the bank level control variables included in the regressions, the results obtained on the LogcsfaGDP variable do not reflect modifications in the structure of assets or liabilities of the banks. First, standard measures of financial development do not seem to explain the loan maturity, while GDP growth and inflation do have a significant effect. Second, the level of development of contractual savings institutions has a positive and significant effect on loan maturity. Given the discussion in the second section, this suggests that, even if banks seem to face higher competitive pressures when contractual savings institutions develop (thus reducing interest spreads), they do not reduce the maturity of loans (in other word they do not seem to concentrate on their core activity). On the

[27] The correlation is weaker if we simply take csfaGDP; this suggests that non linearities are probably important.

contrary, there seems to be a complementarity between the two institutions when concentrating on the loan maturity dimension[28].

In Tables 8 and 9, we show moreover that there is a strong negative correlation between credit risk borne by the banking system and the level of development of contractual savings institutions. It is worthwhile underlying that this strong result does not reflect cross-country differences, for instance the level of economic development[29]. This result complements the conclusions of Impavido, Musalem and Tressel (2001) who show that the corporate sector is more resilient to various shocks when contractual savings institutions are more developed or invest more on the stock exchange.

Finally, we show in Table 10 that, within countries, the development of contractual savings implies a reduction in short-term liabilities of the banking sector. Hence, this result is also consistent with complementarity between banks and contractual savings institutions.

IV CONCLUDING REMARKS

This paper is a first attempt at assessing the interaction between the banking system and contractual savings institutions that have rapidly developed over the past 20 years in many countries. We show that the development of contractual saving is associated with a more efficient banking system. Moreover, our results strongly support the argument that the banking system is more resilient to liquidity and credit risks when contractual savings institutions are more developed. They are consistent with the conclusions drawn by Impavido, Musalem and Tressel (2001) concerning firms' financing patterns.

[28] For various aspects of the role of long-term finance, see the discussion in Impavido, Musalem and Tressel (2001).

[29] Indeed, we obtain the same result in the fixed effect estimations.

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APPENDIX A

Table 1: The Sample

Obs	Country	Maximum Sample Size (per year)	Pension Funds		Insurance Companies		Life Insurance Companies	
			Financial Assets	*Portfolio Composition*	*Financial Assets*	*Portfolio Composition*	*Financial Assets*	*Portfolio Composition*
1	ARGENTINA	110	Yes	Yes	Yes	Yes	No	No
2	AUSTRALIA	87	Yes	Yes	Yes	Yes	Yes	Yes
3	AUSTRIA	149	Yes	No	Yes	No	Yes	No
4	BELGIUM	110	Yes	Yes	Yes	Yes	Yes	Yes
5	BRAZIL	158	Yes	Yes	Yes	Yes	No	No
6	CANADA	72	Yes	Yes	Yes	Yes	Yes	Yes
7	CHILE	35	Yes	Yes	Yes	Yes	Yes	Yes
8	DENMARK	105	Yes	Yes	Yes	Yes	Yes	Yes
9	FINLAND	17	Yes	Yes	Yes	Yes	Yes	Yes
10	FRANCE	516	Yes	No	Yes	No	Yes	No
11	GERMANY	2111	Yes	Yes	Yes	Yes	Yes	Yes
12	GREECE	26	Yes	Yes	Yes	Yes	Yes	Yes
13	HUNGARY	31	Yes	Yes	Yes	Yes	Yes	Yes
14	INDIA	85	Yes	Yes	Yes	Yes	Yes	Yes
15	IRELAND	52	Yes	Yes	Yes	Yes	Yes	Yes
16	ITALY	595	Yes	Yes	Yes	Yes	Yes	Yes
17	JAPAN	213	Yes	No	Yes	No	Yes	No
18	KOREA (SOUTH)	56	Yes	Yes	Yes	Yes	Yes	Yes
19	MALAYSIA	84	Yes	Yes	Yes	Yes	Yes	Yes
20	MEXICO	47	Yes	Yes	Yes	Yes	Yes	No
21	NETHERLANDS	75	Yes	Yes	Yes	Yes	Yes	Yes
22	NEW ZEALAND	18	Yes	Yes	Yes	Yes	Yes	Yes
23	NORWAY	47	Yes	Yes	Yes	Yes	Yes	Yes
24	PORTUGAL	48	Yes	Yes	Yes	Yes	Yes	Yes
25	SINGAPORE	59	Yes	Yes	Yes	Yes	Yes	Yes
26	SOUTH AFRICA	67	Yes	Yes	Yes	Yes	Yes	Yes
27	SPAIN	171	Yes	No	Yes	No	Yes	No
28	SRI LANKA	12	Yes	Yes	Yes	Yes	Yes	Yes
29	SWEDEN	30	Yes	Yes	Yes	Yes	Yes	Yes
30	SWITZERLAND	381	Yes	Yes	Yes	Yes	Yes	Yes
31	THAILAND	34	Yes	Yes	Yes	Yes	Yes	Yes
32	TURKEY	34	Yes	No	Yes	No	Yes	No
33	UNITED KINGDOM	398	Yes	Yes	Yes	Yes	Yes	Yes
34	UNITED STATES	1153	Yes	Yes	Yes	Yes	Yes	Yes

Table 2: Definition of Variables

VARIABLE	DEFINITION
Banks ' Characteristics	
Net Interest Margin (NIM)	(Interest Income - Interest Expenses) / Total Assets
Profitability (Profit)	Total Profit before Taxes / Total Assets
Capitalization (ETA)	Equity / Total Assets
Structure of Assets (LTA)	Loans / Total Assets
Sources of Funds (STFTA)	Customer & Short-term Funding / Total Assets
Overhead (OTTA)	Overhead Expenses -Tax / Total Assets
Maturity of Loans (STL)	Short-term Loans (maturity less than 1 year) / Total Loans
Non Earnings Assets (CTA)	Non Earnings Assets / Total Assets
Credit Risk A (LLTA)	Loan Loss Provisions / Total Assets
Credit Risk B (LLLN)	Loan Loss Provisions / Total Loans
Macroeconomic Factors	
Inflation (INF)	Consumer Price Index Rate of Growth
GDP growth	rate of growth of GDP, adjusted for inflation
Log(GDP/cap)	Ln (GDP/capita) (constant US $)
Budget Balance	Central Government Budget Surplus (+) / Deficit (-) (% GDP)
Financial System Development	
Credit to Private Sector (ec2)	Credit to Private Sector by Financial Intermediaries (% GDP)
Stock Market Capitalization (ec12)	Stock Market Capitalization (% GDP)
Stock Market Activity (ec19)	Value Traded (% GDP)
Turnover Ratio (TOR)	Value Traded (% Capitalization)
Contractual Savings Insitutions	
CS Development (% GDP) (csfaGDP or Log(csfaGDP))	Pension Funds + Life Insurance* Total Financial Assets (% GDP)

* : Life + Non Life Insurance for Argentina and Brazil

Table 3: Summary Statistics (period average)

Country	ETA	LTA	STFTA	NIM	OTTA	CTA	Profit	STL	ec2	ec12	ec19	TOR	csfaGDP	Bud Bal.	LLTA
	%	%	%	%	%	%	%	%	%	%	%	%	%	% GDP	%
Argentina	14.62	54.59	75.62	3.99	6.50	3.06	1.18	NA	28.06	16.34	4.25	30.27	2.61	-1.10	1.56
Australia	6.45	66.91	71.80	2.36	2.26	0.76	1.38	NA	83.61	78.69	31.46	38.95	58.88	-0.99	0.34
Austria	5.86	43.81	67.39	1.35	1.26	1.70	0.51	NA	125.62	13.87	7.16	54.12	18.70	-3.52	0.10
Belgium	3.64	38.14	85.52	1.42	1.38	0.32	0.60	20.65	138.97	49.77	10.09	18.15	24.53	-4.35	0.21
Brazil	8.18	33.95	62.55	6.55	9.17	1.94	0.86	NA	74.84	23.47	13.69	56.27	8.15	-4.67	1.16
Canada	5.69	59.81	81.09	2.05	1.91	1.17	0.96	NA	96.59	73.17	37.40	48.85	60.84	-3.80	0.53
Switzerland	5.48	44.78	67.75	1.05	2.02	2.31	0.61	62.25	180.83	156.85	121.95	71.71	96.69	-1.22	0.34
Chile	6.31	49.68	59.74	2.69	2.26	7.76	-0.02	NA	64.89	96.73	9.27	9.37	42.23	1.84	0.34
Germany	3.65	55.73	62.22	1.46	1.08	1.09	0.56	38.04	126.58	32.96	35.10	105.37	21.82	-1.78	0.06
Denmark	7.15	65.34	45.49	2.18	1.18	0.69	0.78	26.16	57.62	40.56	18.41	46.56	52.06	-0.93	0.85
Spain	6.15	48.96	76.81	2.70	1.99	2.84	1.16	NA	105.55	41.13	46.35	86.99	12.98	-4.78	0.49
Finland	5.52	48.80	74.03	1.73	1.76	0.94	0.05	31.73	72.74	69.25	24.62	33.08	43.56	-8.00	0.75
France	4.74	41.53	70.24	1.40	1.53	0.59	0.41	NA	103.35	46.29	24.34	51.16	29.79	-4.47	0.51
United Kingdom	5.32	52.54	75.55	2.03	2.01	1.91	1.07	28.74	122.62	135.95	54.89	39.50	132.21	-3.71	0.42
Greece	4.80	40.51	77.95	1.65	1.74	7.51	1.21	92.53	95.00	38.28	25.71	41.54	8.45	-8.37	0.31
Hungary	4.41	38.15	55.58	2.35	2.61	16.53	-0.81	54.94	80.26	13.59	9.62	39.94	2.41	-4.35	2.36
India	6.24	41.13	64.27	3.46	1.80	0.41	1.78	NA	47.98	31.60	11.15	36.48	7.23	-2.63	0.28
Ireland	7.27	56.06	77.58	2.09	1.62	1.75	1.17	27.20	69.98	28.57	32.81	106.46	53.66	-1.33	0.24
Italy	6.16	49.35	66.48	2.30	2.05	0.53	0.69	57.05	97.33	26.21	15.77	49.67	10.16	-7.75	0.47
Japan	4.44	62.32	72.46	1.22	1.19	0.70	0.05	44.05	251.86	74.17	26.78	36.61	29.59	0.16	0.80
Korea	5.22	52.25	72.74	1.50	1.68	2.24	0.07	NA	73.93	38.29	59.69	165.79	22.05	-0.29	0.40
Sri Lanka	6.80	44.86	54.15	3.05	2.63	7.46	1.40	NA	35.20	16.57	2.22	12.87	15.87	-6.77	0.49
Mexico	6.25	60.15	73.91	2.39	2.23	3.14	0.48	NA	36.96	34.12	12.37	36.82	0.63	0.63	0.62
Malaysia	7.57	52.83	85.34	2.15	0.88	4.28	1.02	NA	130.25	207.07	108.41	53.91	21.33	1.60	0.78
NewZealand	4.77	72.66	83.17	2.62	2.37	0.34	1.33	NA	98.74	54.38	16.52	30.29	19.31	1.62	0.11
Netherlands	5.19	55.79	67.75	1.60	1.76	1.01	0.86	NA	113.14	96.18	72.92	64.23	132.58	-2.25	0.24
Norway	6.91	63.79	65.90	2.47	1.97	1.01	1.00	NA	79.07	30.67	18.51	57.08	29.78	-1.82	0.66
Portugal	5.63	41.46	80.59	2.58	2.02	3.92	0.75	27.41	89.05	27.44	14.24	42.32	10.40	NA	NA
Singapore	11.18	43.60	82.27	1.33	0.47	2.30	1.24	63.79	81.66	159.46	76.88	46.79	94.06	11.63	0.28
Sweden	5.15	68.54	46.94	1.63	1.11	0.55	0.44	21.80	125.93	84.09	48.84	52.53	39.84	-7.41	1.09
Thailand	6.30	66.77	78.43	2.31	1.64	2.38	-0.35	NA	130.67	57.43	38.43	72.10	3.86	1.22	1.18
Turkey	10.31	37.68	74.91	7.71	4.83	2.70	3.56	79.64	33.03	21.38	22.22	115.83	0.24	-5.67	0.41
South Africa	7.67	66.79	82.68	3.04	2.91	1.02	1.53	NA	134.17	157.36	22.21	13.95	102.69	-5.45	0.52
United States	6.35	37.44	63.82	2.18	2.72	3.43	1.43	NA	133.24	109.05	91.32	77.08	86.99	-2.38	0.28

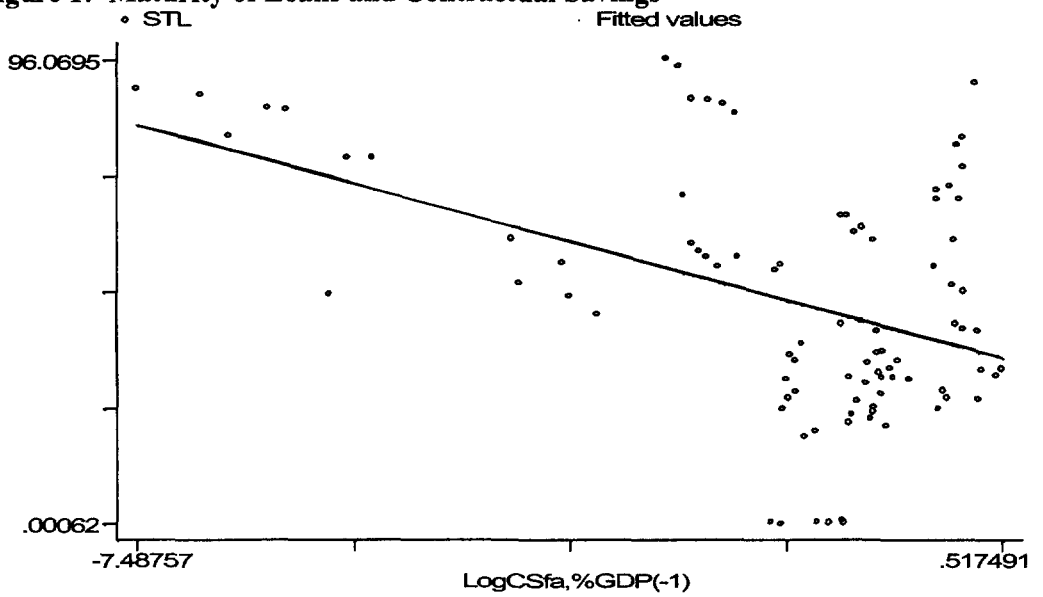
Table 4: Pairwise Correlations

	ETA	LTA	STFTA	NIM	Profit	OTTA	CTA
ETA	1						
LTA	-0.0161 *0.7717*	1					
STFTA	0.0801 *0.1502*	0.0164 *0.7693*	1				
NIM	0.4629 *0*	-0.1108 *0.0455*	0.0448 *0.4218*	1			
Profit	0.4304 *0*	-0.0825 *0.1386*	-0.0181 *0.7448*	0.4237 *0*	1		
OTTA	0.4622 *0*	-0.2043 *0.0002*	0.0368 *0.5092*	0.6905 *0*	0.1428 *0.0101*	1	
CTA	-0.0217 *0.6976*	-0.2578 *0*	-0.1733 *0.0017*	-0.0088 *0.8744*	-0.0065 *0.9069*	0.0316 *0.5704*	1
STL	0.2065 *0.0214*	-0.6058 *0*	0.2039 *0.0231*	0.2517 *0.0048*	0.1798 *0.0457*	0.3336 *0.0002*	0.2593 *0.0036*
LLTA	0.14 *0.0133*	0.0795 *0.1612*	0.0554 *0.3308*	0.193 *0.0006*	-0.4666 *0*	0.2647 *0*	0.0095 *0.8678*
LLLN	0.1376 *0.015*	-0.0939 *0.0979*	0.0408 *0.4744*	0.2244 *0.0001*	-0.4432 *0*	0.3275 *0*	0.0516 *0.3651*
ec2	-0.3393 *0*	0.1425 *0.0171*	0.1167 *0.0515*	-0.3363 *0*	-0.1954 *0.001*	-0.2887 *0*	-0.1226 *0.0407*
ec12	0.0212 *0.7182*	0.0587 *0.3185*	0.1681 *0.0041*	-0.2161 *0.0002*	0.1188 *0.0433*	-0.247 *0*	-0.0459 *0.4363*
ec19	-0.0116 *0.8441*	-0.0683 *0.2462*	0.0392 *0.5067*	-0.2017 *0.0005*	0.1271 *0.0307*	-0.205 *0.0005*	-0.0315 *0.5935*
TOR	-0.0383 *0.5154*	-0.0591 *0.3161*	-0.0606 *0.3048*	0.0028 *0.962*	0.1148 *0.0513*	-0.0373 *0.5272*	-0.0961 *0.1032*
LogCSfa,%GDP	-0.2026 *0.0032*	0.2006 *0.0035*	0.0259 *0.7095*	-0.5857 *0*	-0.2577 *0.0002*	-0.434 *0*	-0.253 *0.0002*
Csfa,%GDP	0.0204 *0.7691*	0.1166 *0.092*	0.1019 *0.1413*	-0.2648 *0.0001*	0.0233 *0.7375*	-0.187 *0.0066*	-0.1611 *0.0195*

	STL	LLTA	LLLN	ec2	ec12	ec19	TOR
STL	1						
LLTA	-0.046 *0.6123*	1					
LLLN	0.0419 *0.6442*	0.9613 *0*	1				
ec2	-0.1445 *0.1413*	-0.024 *0.6949*	-0.066 *0.2809*	1			
ec12	0.0761 *0.4297*	-0.19 *0.0014*	-0.1967 *0.0009*	0.3627 *0*	1		
ec19	0.2208 *0.021*	-0.1593 *0.0076*	-0.1462 *0.0144*	0.3224 *0*	0.7544 *0*	1	
TOR	0.1792 *0.0622*	-0.1032 *0.0849*	-0.0878 *0.1429*	0.0203 *0.7352*	-0.0204 *0.727*	0.4393 *0*	1
LogCSfa,%GDP	-0.4895 *0*	-0.1504 *0.0327*	-0.2295 *0.001*	0.3929 *0*	0.571 *0*	0.3587 *0*	-0.2162 *0.0017*
Csfa,%GDP	-0.2067 *0.0592*	-0.1795 *0.0106*	-0.2355 *0.0007*	0.2947 *0*	0.7248 *0*	0.5148 *0*	-0.1285 *0.0644*

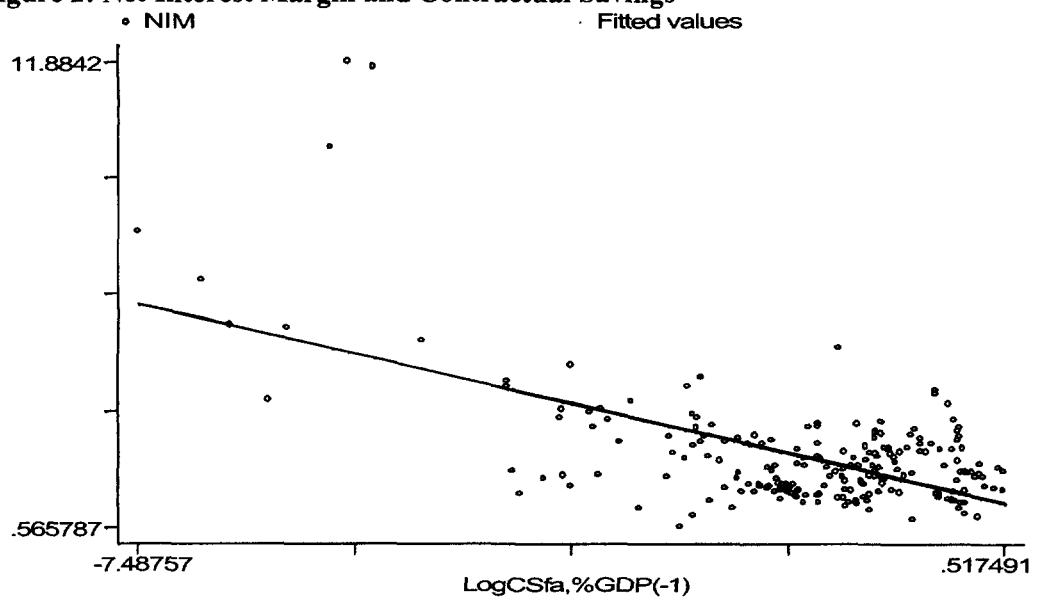
note: p-values are in italic

Figure 1: Maturity of Loans and Contractual Savings



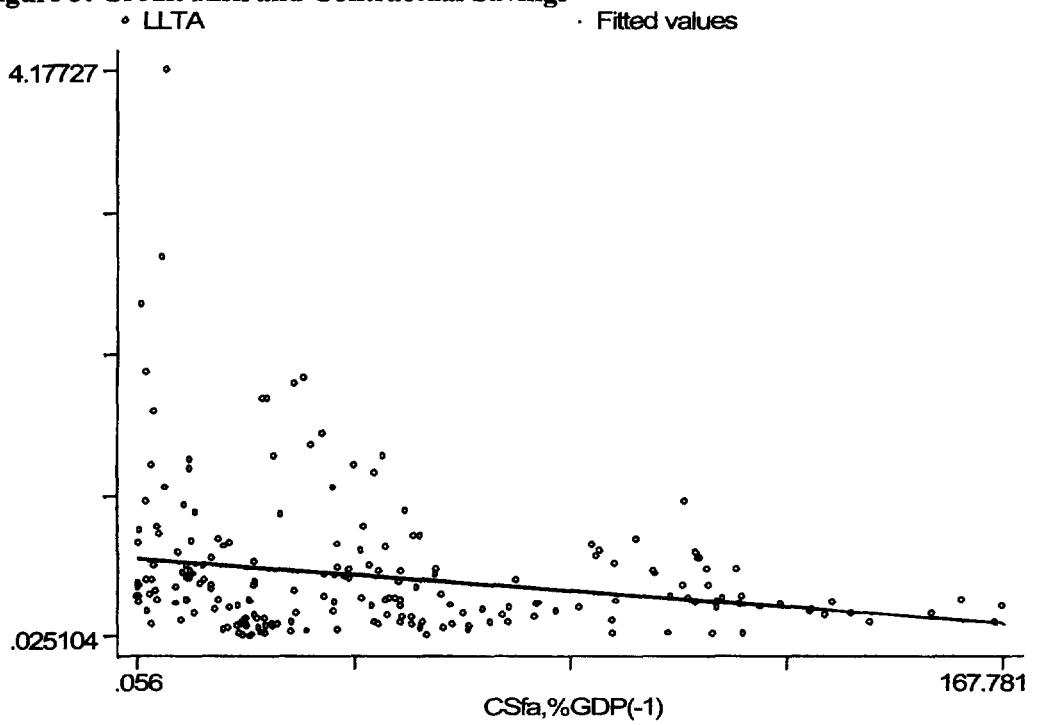
Regression Line: STL = -6.03 *(4.58)* * Log(Csfa,%GDP)+37.5 (R2=0.18)

Figure 2: Net Interest Margin and Contractual Savings



Regression Line: NIM = -0.60 *(-10.78)* * Log(Csfa,%GDP)+1.47 (R2=0.35)

Figure 3: Credit Risk and Contractual Savings



Regression Line: LLTA = -2.8 E-3 (-3.23) * Csfa,%GDP + 0.6 (R2 = 0.043)

Table 5 : Contractual Savings Institutions and Bank Net Interest Margins

Pooled and Panel Estimates

Dependent Variable :	*Net Interest Margin*			
Explanatory Variables :	***OLS***		***Fixed Effects***	
CS variable	**dated t-1**	**IV**	**dated t-1**	**IV**
Banks' Characteristics :				
Capitalization (ETA)	0.112 ***	*0.106* ***	0.15 ***	0.153 ***
	6.07	*5.85*	*9.99*	*10.61*
Structure of Assets (LTA)	0.031 ***	0.0307 ***	0.038 ***	0.039 ***
	13.53	*12.75*	*10.69*	*10.82*
Sources of Funds (STFTA)	0.008 ***	0.007 ***	0.005 *	0.006 **
	3.33	*3.02*	*1.69*	*1.91*
Non Earnings Assets (CTA)	-0.007	-0.014 *	0.027 ***	0.012
	-0.53	*-1.72*	*2.95*	*0.60*
Overhead (OTTA)	0.377 ***	0.388 ***	0.533 ***	0.526 ***
	9.01	*8.50*	*8.77*	*8.91*
Macroeconomic Factors :				
Inflation	0.038 ***	0.043 ***	-0.028 ***	-0.032 ***
	5.46	*6.55*	*-2.82*	*-3.03*
GDP growth	0.035 **	0.048 ***	-0.016	-0.021 **
	2.33	*3.61*	*-1.55*	*-1.85*
Log (GDP/Capita)	-0.03	-0.05	-0.12	-0.09
	-0.47	*-0.72*	*-0.54*	*-0.42*
Government Budget Balance (% GDP)	-0.03 ***	-0.031 ***	-0.016 *	-0.021 **
	-3.71	*-3.88*	*-1.63*	*-2.17*
Financial System Development :				
Credit to Private Sector	-0.0010	-0.0007	-0.005 **	-0.008 ***
	-1.00	*-0.68*	*-2.18*	*-2.83*
Stock Market Capitalization	-0.0008	-0.0016	0.0008	0.0010
	-0.57	*-1.12*	*0.55*	*0.72*
Stock Market Activity	0.0023	0.0030	0.0037 ***	0.0034 ***
	1.28	*1.64*	*2.69*	*2.57*
Stock Market Liquidity (Turnover Ratio)	-0.0026 **	-0.0032 ***	-0.0029 ***	-0.0027 ***
	-2.16	*-2.64*	*-3.39*	*-3.01*
Contractual Savings Development (Log of financial assets, % GDP)	**-0.171 *** **	**-0.17 *** **	0.061	0.189
	-4.26	*-4.27*	*0.47*	*1.39*
Year Dummies	Yes	Yes	Yes	Yes
Wald Test	1140.75 (20)	1162 (20)	3660.1 (48)	3865 (48)
Nb of Observations	156	153	156	153
Nb of Years	7	7	7	7
Nb of Countries	30	30	30	30

Method of estimation:

GLS, with heteroscedastic error structure and no autocorrelation within panel; no cross-sectional correlation.

Instruments dated t-1 for contractual savings variable:

dependent variable, real GDP per capita growth, rate of change of M2/GDP, rate of change of real effective exchange rate, volatility of inflation, volatility of interest rate, openness, share of the population over 64, bank credit, market capitalization and liquidity

Table 6 : Contractual Savings Institutions and Bank Profitability

Pooled and Panel Estimates

Dependent Variable :	*Profitability (Profit before Tax / Total Assets)*			
Explanatory Variables :	***OLS***		***Fixed Effects***	
CS variable	**dated t-1**	**IV**	**dated t-1**	**IV**
Banks' Characteristics :				
Capitalization (ETA)	0.126 ***	0.127 ***	0.281 ***	0.289 ***
	6.06	*5.96*	*10.19*	*10.11*
Structure of Assets (LTA)	0.021 ***	0.0205 ***	-0.013 **	-0.012 **
	7.11	*6.94*	*-2.41*	*-2.10*
Sources of Funds (STFTA)	0.016 ***	0.017 ***	0.0048	0.0056
	5.65	*5.54*	*0.86*	*0.93*
Non Earnings Assets (CTA)	0.022 ***	0.024 ***	0.012 ***	-0.006
	2.85	*2.88*	*2.45*	*-0.29*
Overhead (OTTA)	0.033	0.035	-0.219 ***	-0.246 ***
	0.58	*0.60*	*-2.59*	*-2.93*
Macroeconomic Factors :				
Inflation	0.056 ***	0.056 ***	0.0195	0.033 **
	7.57	*7.51*	*1.42*	*2.05*
GDP growth	0.066 ***	0.065 ***	0.038 ***	0.056 ***
	3.924	*3.89*	*2.596*	*3.218*
Log (GDP/Capita)	0.27 ***	0.308 ***	1.18 ***	1.12 ***
	2.663	*2.894*	*3.319*	*3.202*
Government Budget Balance (% GDP)	-0.013	-0.015	-0.008	-0.014
	-1.351	*-1.525*	*-0.586*	*-0.967*
Financial System Development :				
Credit to Private Sector	0.0036 ***	0.0037 ***	-0.0139 ***	-0.0138 ***
	3.39	*3.40*	*-3.88*	*-3.09*
Stock Market Capitalization	-0.00076	-0.00024	-0.00066	-0.00027
	-0.468	*-0.144*	*-0.371*	*-0.138*
Stock Market Activity	0.0029	0.0025	0.0020	0.0013
	1.47	*1.28*	*1.19*	*0.74*
Stock Market Liquidity (Turnover Ratio)	-0.002 ***	-0.0019 **	-0.0011	-0.001
	-2.61	*-2.26*	*-1.19*	*-0.64*
Contractual Savings Development (Log of financial assets, % GDP)	0.313	-0.239	**0.31** **	**0.316** *
	0.096	*-0.478*	*1.87*	*1.61*
Year Dummies	Yes	Yes	Yes	Yes
Wald Test	418.9 (20)	405.46 (20)	1202 (48)	1117.85 (48)
Nb of Observations	156	153	156	153
Nb of Years Included	7	7	7	7
Nb of Countries	30	30	30	30

Method of estimation:

GLS, with heteroscedastic error structure and no autocorrelation within panel; no cross-sectional correlation.

Instruments dated t-1 for contractual savings variable:

contractual savings variable, real GDP per capita growth, rate of change of M2/GDP, rate of change of real effective exchange rate, volatility of inflation, volatility of interest rate, openness, share of the population over 64, bank credit, market capitalization and liquidity

Table 7 : Contractual Savings Institutions and Bank Loan Maturity

Pooled and Panel Estimates

Dependent Variable :	*Loan Maturity (Short-term Loans / Total Loans)*			
Explanatory Variables:	***OLS***		***Fixed Effects***	
CS variable	**dated t-1**	**IV**	**dated t-1**	**IV**
Banks' Characteristics :				
Capitalization (ETA)	-0.727	-0.822	0.776	1.414 *
	-0.66	*-0.71*	*0.99*	*1.62*
Structure of Assets (LTA)	-0.026	0.169	-1.024 ***	-1.305 ***
	-0.05	*0.32*	*-2.74*	*-3.23*
Sources of Funds (STFTA)	0.577 **	0.496	0.259	0.503 *
	1.82	*1.33*	*0.93*	*1.70*
Non Earnings Assets (CTA)	-0.046	-0.570	-0.725 **	0.665
	-0.07	*-0.66*	*-2.33*	*1.05*
Overhead (OTTA)	-3.61	-2.38	-11.19 ***	-11.81 ***
	-0.85	*-0.55*	*-3.07*	*-2.86*
Macroeconomic Factors :				
Inflation	-0.543	-1.059 **	-1.96 ***	-1.82 ***
	-1.04	*-1.82*	*-4.81*	*-3.34*
GDP growth	-0.334	-0.707	-1.48 ***	-1.35 **
	-0.42	*-0.83*	*-2.84*	*-1.93*
Log (GDP/Capita)	-10.34	-30.96 **	-32.59 ***	-30.28 **
	-0.92	*-1.86*	*-2.59*	*-2.29*
Government Budget Balance (% GDP)	0.727	1.237	1.738 ***	2.108 ***
	1.04	*1.52*	*3.04*	*3.41*
Financial System Development :				
Credit to Private Sector	-0.033	-0.003	0.208	0.258
	-0.45	*-0.03*	*1.46*	*1.23*
Stock Market Capitalization	-0.100	-0.217	-0.068	-0.090
	-0.82	*-1.49*	*-0.64*	*-0.82*
Stock Market Activity	0.544 ***	0.676 ***	0.315 ***	0.311 ***
	3.47	*3.97*	*2.82*	*2.70*
Stock Market Liquidity (Turnover Ratio)	-0.081	-0.106	-0.104 ***	-0.135 ***
	-0.88	*-1.08*	*-2.87*	*-3.39*
Contractual Savings Development	**-11.98 *** **	**-10.86 ** **	-8.123	**-11.9 ** **
(Log of financial assets, % GDP)	*-2.94*	*-2.19*	*-1.48*	*-1.84*
Year Dummies	Yes	Yes	Yes	Yes
Wald Test	193.73 (19)	165 (23)	4660.5 (32)	2329 (33)
Log Likelihood	-237.36	-235.13	-154.5	-153.51
Nb of Observations	67	65	67	65
Nb of Years	6	6	6	6
Nb of Countries	14	14	14	14

Method of estimation:
GLS, with heteroscedastic error structure and no autocorrelation within panel; no cross-sectional correlation.

Instruments dated t-1 for contractual savings variable:
dependent variable, real GDP per capita growth, rate of change of M2/GDP, rate of change of real effective exchange rate, volatility of inflation, volatility of interest rate, openness, share of the population over 64, bank credit, market capitalization and liquidity

Table 8 : Contractual Savings Institutions and Bank Credit Risk

Pooled and Panel Estimates

Dependent Variable :	*Loan Loss Provisions / Total Assets*			
Explanatory Variables :	***OLS***		***Fixed Effects***	
CS variable	**dated t-1**	**IV**	**dated t-1**	**IV**
Banks' Characteristics :				
Capitalization (ETA)	0.048 ***	0.056 ***	-0.063 ***	-0.064 ***
	3.73	*4.40*	*-4.31*	*-4.48*
Structure of Assets (LTA)	0.0031 **	0.0028 **	0.012 ***	0.010 ***
	2.02	*1.85*	*6.28*	*5.00*
Sources of Funds (STFTA)	-0.002 *	-0.002	-0.004 *	-0.005 *
	-1.66	*-1.34*	*-1.77*	*-1.95*
Non Earnings Assets (CTA)	0.0039	0.0038	0.004 **	0.011
	0.82	*0.93*	*1.85*	*1.13*
Overhead (OTTA)	0.044 ***	0.027	0.16 ***	0.17 ***
	2.44	*1.42*	*4.25*	*4.63*
Macroeconomic Factors :				
Inflation	-0.028 ***	-0.027 ***	-0.025 ***	-0.025 ***
	-6.60	*-6.38*	*-3.72*	*-3.54*
GDP growth	-0.059 ***	-0.055 ***	-0.037 ***	-0.033 ***
	-6.22	*-6.23*	*-4.87*	*-4.29*
Log (GDP/Capita)	-0.167 ***	-0.175 ***	0.105	0.040
	-3.01	*-3.14*	*0.74*	*0.30*
Government Budget Balance (% GDP)	-0.026 ***	-0.028 ***	-0.014 **	-0.009
	-4.47	*-4.66*	*-2.06*	*-1.34*
Financial System Development :				
Credit to Private Sector	-0.0017 ***	-0.0016 ***	0.016 ***	0.018 ***
	-3.02	*-2.89*	*8.55*	*8.98*
Stock Market Capitalization	0.0009	0.0003	-0.002 **	-0.0023 ***
	1.042	*0.364*	*-2.159*	*-2.796*
Stock Market Activity	0.0008	0.0013	0.0025 ***	0.0031 ***
	0.86	*1.36*	*3.04*	*4.02*
Stock Market Liquidity (Turnover Ratio)	0.0001	-0.0001	-0.0009 *	-0.001 **
	0.12	*-0.183*	*-1.713*	*-2.08*
Contractual Savings Development	**-0.0017 *** **	**-0.0013 ** **	**-0.0042 ** **	**-0.0064 *** **
(Financial assets, % GDP)	*-2.86*	*-2.30*	*-2.11*	*-3.40*
Year Dummies	Yes	Yes	Yes	Yes
Wald Test	290.5 (20)	289.3 (20)	1412 (48)	1841.3 (48)
Nb of Observations	153	151	153	151
Nb of Years Included	7	7	7	7
Nb of Countries	30	30	30	30

Method of estimation:
GLS, with heteroscedastic error structure and no autocorrelation within panel; no cross-sectional correlation.

Instruments dated t-1 for contractual savings variable:
contractual savings variable, real GDP per capita growth, rate of change of M2/GDP, rate of change of real effective exchange rate, volatility of inflation, volatility of interest rate, openness, share of the population over 64, bank credit, market capitalization and liquidity

Table 9 : Contractual Savings Institutions and Bank Credit Risk

Pooled and Panel Estimates

Dependent Variable :	*Loan Loss Provisions / Loans*			
Explanatory Variables :	***OLS***		***Fixed Effects***	
CS variable	**dated t-1**	**IV**	**dated t-1**	**IV**
Banks' Characteristics :				
Capitalization (ETA)	0.07 ***	0.08 ***	-0.12 ***	-0.13 ***
	3.31	*3.80*	*-4.95*	*-5.41*
Structure of Assets (LTA)	-0.02 ***	-0.02 ***	-0.02 ***	-0.02 ***
	-7.25	*-7.47*	*-6.91*	*-7.55*
Sources of Funds (STFTA)	-0.01 ***	-0.01 ***	-0.004	-0.003
	-2.99	*-2.68*	*-0.82*	*-0.75*
Non Earnings Assets (CTA)	0.005	0.003	0.006	0.014
	0.43	*0.33*	*0.73*	*0.70*
Overhead (OTTA)	0.26 ***	0.26 ***	0.55 ***	0.53 ***
	9.06	*9.83*	*8.37*	*8.42*
Macroeconomic Factors :				
Inflation	-0.06 ***	-0.06 ***	-0.05 ***	-0.04 ***
	-7.77	*-7.75*	*-3.76*	*-3.56*
GDP growth	-0.11 ***	-0.10 ***	-0.07 ***	-0.07 ***
	-6.38	*-6.31*	*-5.41*	*-5.54*
Log (GDP/Capita)	-0.27 ***	-0.30 ***	0.50 **	0.56 **
	-2.86	*-3.16*	*1.99*	*2.38*
Government Budget Balance (% GDP)	-0.04 ***	-0.03 ***	-0.01	-0.01
	-3.959	*-3.912*	*-1.084*	*-0.824*
Financial System Development :				
Credit to Private Sector	-0.004 ***	-0.005 ***	0.028 ***	0.029 ***
	-4.65	*-4.53*	*9.18*	*9.66*
Stock Market Capitalization	0.003 *	0.002	-0.0005	-0.0009
	1.85	*1.14*	*-0.34*	*-0.61*
Stock Market Activity	0.0006	0.0014	0.001	0.003
	0.36	*0.89*	*0.96*	*2.08*
Stock Market Liquidity	0.0014	0.0011	-0.0009	-0.0007
(Turnover Ratio)	*1.16*	*0.92*	*-0.999*	*-0.83*
Contractual Savings Development	**-0.0036 *** **	**-0.003 *** **	**-0.017 *** **	**-0.021 *** **
(Financial assets, % GDP)	*-4.00*	*-3.35*	*-4.60*	*-6.35*
Year Dummies	Yes	Yes	Yes	Yes
Wald Test	676.5 (20)	1190.2 (20)	2088 (48)	2411 (48)
Nb of Observations	153	153	153	151
Nb of Years Included	7	7	7	7
Nb of Countries	30	30	30	30

Method of estimation:

GLS, with heteroscedastic error structure and no autocorrelation within panel; no cross-sectional correlation.

Instruments dated t-1 for contractual savings variable:
contractual savings variable, real GDP per capita growth, rate of change of M2/GDP, rate of change of real effective exchange rate, volatility of inflation, volatility of interest rate, openness, share of the population over 64, bank credit, market capitalization and liquidity

Table 10 : Contractual Savings Institutions and Bank Liabilities

Pooled and Panel Estimates

Dependent Variable :	*Customer and Short-term Funding / Total Asset*			
Explanatory Variables :	***OLS***		***Fixed Effects***	
CS variable	***dated t-1***	***IV***	***dated t-1***	***IV***
Banks' Characteristics :				
Capitalization (ETA)	-0.134	-0.331	-0.32	-0.48
	-0.34	*-0.82*	*-0.89*	*-1.32*
Structure of Assets (LTA)	-0.18 ***	-0.19 ***	0.1	0.11
	-2.72	*-2.89*	*1.36*	*1.61*
Non Earnings Assets (CTA)	-0.89 ***	-1.11 ***	-0.24 ***	0.3
	-3.93	*-8.10*	*-3.5*	*1.4*
Overhead (OTTA)	1.469	1.591	5.06 ***	4.71 ***
	1.51	*1.61*	*5.67*	*5.39*
Macroeconomic Factors :				
Inflation	-0.07	-0.05	0.41 ***	0.19
	-0.80	*-0.52*	*2.52*	*1.07*
GDP growth	0.02	0.10	0.53 ***	0.33**
	0.07	*0.40*	*3.89*	*2.23*
Log (GDP/Capita)	-5.44 ***	-6.05 ***	-13.61 ***	-14.61 ***
	-3.41	*-3.65*	*-3.37*	*-3.85*
Government Budget Balance (% GDP)	0.62 ***	0.66 ***	0.36 **	0.22
	3.51	*3.67*	*2.19*	*1.18*
Financial System Development :				
Credit to Private Sector	0.01	0.01	-0.11 ***	-0.19 ***
	0.33	*0.45*	*-3.43*	*-3.76*
Stock Market Capitalization	0.04	0.03	0.01	0.03
	1.34	*0.98*	*0.77*	*1.38*
Stock Market Activity	-0.05	-0.04	-0.01	-0.02
	-1.34	*-1.00*	*-0.61*	*-0.95*
Stock Market Liquidity	-0.021	-0.034	-0.004	0.001
(Turnover Ratio)	*-1.01*	*-1.52*	*-0.25*	*0.07*
Contractual Savings Development	0.01	0.01	**-0.14 *** **	**-0.11 ** **
(Financial assets, % GDP)	*0.44*	*0.37*	*-2.95*	*-2.26*
Year Dummies	Yes	Yes	Yes	Yes
Wald Test	123.14 (19)	163.1 (19)	4153 (47)	4632 (47)
Nb of Observations	156	153	156	153
Nb of Years Included	7	7	7	7
Nb of Countries	30	30	30	30

Method of estimation:

GLS, with heteroscedastic error structure and no autocorrelation within panel; no cross-sectional correlation.

Instruments dated t-1 for contractual savings variable:

contractual savings variable, real GDP per capita growth, rate of change of M2/GDP, rate of change of real effective exchange rate, volatility of inflation, volatility of interest rate, openness, share of the population over 64, bank credit, market capitalization and liquidity

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